

## Claim Amendments

### IN THE CLAIMS:

Please amend claims 1,2,4,7,9,13, and 14 as follows:

1. (Currently amended) A supported distributed Bragg reflector, comprising:
  - a substrate;
  - a nucleation layer deposited on said substrate, said nucleation layer being of sufficient thickness to promote continuous growth of subsequent deposited layers;
  - an interlayer deposited on said nucleation layer, said interlayer controlling mismatch-induced stress and suppressing formation of cracks and said interlayer comprising a material selected from AlN,  $\text{Al}_y\text{Ga}_{1-y}\text{N}$ ,  $\text{Al}_x\text{Ga}_{1-x}\text{N}$ , and  $\text{Al}_y\text{B}_{1-y}\text{N}$  AlBN, where  $0 < y < 1$   ~~$0 < x < 1$~~ ; and
  - multiple pairs of  $(\text{Al}_w\text{Ga}_x\text{B}_{1-w-x}\text{N}/\text{Al}_{w'}\text{Ga}_{x'}\text{B}_{1-w'-x'}\text{N})$  layers, where  $0 \leq w \leq 1$ ,  $0 \leq x \leq 1$ ,  $0 \leq w' \leq 1$ ,  $0 \leq x' \leq 1$ ,  $(\text{Al,Ga,B})\text{N}/(\text{Al,Ga,B})\text{N}$  layers deposited on said interlayer, thereby forming a supported distributed Bragg reflector.
2. (Currently amended) The supported distributed Bragg reflector of claim 1 further comprising an interlayer deposited between two of said multiple pairs of  $(\text{Al}_w\text{Ga}_x\text{B}_{1-w-x}\text{N}/\text{Al}_{w'}\text{Ga}_{x'}\text{B}_{1-w'-x'}\text{N})$   $(\text{Al,Ga,B})\text{N}/(\text{Al,Ga,B})\text{N}$  layers.
3. (Original) The supported distributed Bragg reflector of claim 1 wherein said substrate comprises a material selected from sapphire, silicon, silicon carbide, lithium gallate, lithium aluminate, and lithium nitrate.
4. (Currently amended) The supported distributed Bragg reflector of claim 1 wherein said nucleation layer comprises a GaN material.
5. (Original) The supported distributed Bragg reflector of claim 4 wherein said nucleation layer has a thickness greater than approximately 0.5 microns.
6. (Original) The supported distributed Bragg reflector of claim 1 wherein said interlayer has a thickness greater than approximately 20 Angstroms and less than approximately 1000 Angstroms.
7. (Currently amended) The supported distributed Bragg reflector of claim 1 wherein said pairs of  $(\text{Al}_w\text{Ga}_x\text{B}_{1-w-x}\text{N}/\text{Al}_{w'}\text{Ga}_{x'}\text{B}_{1-w'-x'}\text{N})$   $(\text{Al,Ga,B})\text{N}/(\text{Al,Ga,B})\text{N}$  layers comprise

layers each with a  $\text{Al}_w\text{Ga}_x\text{B}_{1-w-x}\text{N}$  ( $\text{Al,Ga,B}$ )N layer with a thickness of greater than approximately 20 Angstroms and less than approximately 1000 Angstroms and a  $\text{Al}_w\text{Ga}_x\text{B}_{1-w-x}\text{N}$  ( $\text{Al,Ga,B}$ )N layer of greater than approximately 20 Angstroms and less than approximately 1000 Angstroms.

8. (Original) The supported distributed Bragg reflector of claim 1 wherein said interlayer material further comprises a dopant, said dopant selected from less than approximately 1% by weight of calcium, zinc, silicon, magnesium, carbon, bismuth, oxygen, antimony, and indium.
9. (Currently amended) The supported distributed Bragg reflector of claim 1 wherein said pairs of  $\text{Al}_w\text{Ga}_x\text{B}_{1-w-x}\text{N}/\text{Al}_w\text{Ga}_x\text{B}_{1-w-x}\text{N}$  ( $\text{Al,Ga,B}$ )N/ $\text{Al}_w\text{Ga}_x\text{B}_{1-w-x}\text{N}$  ( $\text{Al,Ga,B}$ )N layers comprise  $\text{Al}_y\text{Ga}_{1-y}\text{N}/\text{GaN}$  layers, where  $0 < y < 1$ .
10. (Original) The supported distributed Bragg reflector of claim 9 wherein said multiple pairs of  $\text{Al}_y\text{Ga}_{1-y}\text{N}/\text{GaN}$  layers number more than 50 pairs and less than 70 pairs, wherein at least one additional interlayer is interspersed between said multiple pairs of  $\text{Al}_y\text{Ga}_{1-y}\text{N}/\text{GaN}$  layers.
11. (Original) The supported distributed Bragg reflector of claim 10 wherein the distributed Bragg reflector has a reflectivity value greater than 0.99.
12. (Original) The supported distributed Bragg reflector of claim 1 wherein said interlayer results in an initial compressive growth stress.
13. (Currently amended) A supported distributed Bragg reflector, comprising:
  - a substrate;
  - a GaN nucleation layer deposited on said substrate, said GaN nucleation layer having a thickness greater than approximately 0.5 microns;
  - a first interlayer deposited on said nucleation layer, said first interlayer controlling mismatch-induced stress and suppressing formation of cracks and comprising a material selected from  $\text{AlN}$ ,  $\text{Al}_x\text{Ga}_{1-x}\text{N}$ , and  $\text{Al}_x\text{B}_{1-x}\text{N}$   $\text{AlBN}$ , where  $0 < x < 1$ ;
  - at least five pairs of  $\text{Al}_y\text{Ga}_{1-y}\text{N}/\text{GaN}$  layers, where  $0 < y < 1$ , deposited on said interlayer;
  - a second interlayer deposited on said  $\text{Al}_y\text{Ga}_{1-y}\text{N}/\text{GaN}$  layers, said second interlayer controlling mismatch-induced stress and suppressing formation of

cracks and comprising a material selected from AlN,  $\text{Al}_x\text{Ga}_{1-x}\text{N}$ , and  $\text{Al}_x\text{B}_{1-x}\text{N}$  AIBN, where  $0 < x < 1$ ; and

at least five pairs of  $\text{Al}_y\text{Ga}_{1-y}\text{N}$  /GaN layers, where  $0 < y < 1$ , deposited on said second interlayer, thereby forming a supported distributed Bragg reflector.

14. (Currently amended) A supported semiconductor lattice structure, comprising:

a substrate;

a nucleation layer deposited on said substrate, said nucleation layer being of sufficient thickness to promote ~~promoting~~ continuous growth of subsequent deposited layers;

an interlayer deposited on said nucleation layer, said interlayer controlling mismatch-induced stress and suppressing formation of cracks and comprising a material selected from ~~from~~ an  $\text{Al}_w\text{Ga}_x\text{B}_{1-w-x}\text{N}$  material, where  $0 \leq w \leq 1$ ,  $0 \leq x \leq 1$ , ~~(Al,Ga,B)N material~~, said interlayer having a thickness greater than approximately 20 Angstroms and less than approximately 1000 Angstroms; and

a layer of  $\text{Al}_{w'}\text{Ga}_{x'}\text{B}_{1-w'-x'}\text{N}$ , where  $0 \leq w' \leq 1$ ,  $0 \leq x' \leq 1$ , ~~(Al,Ga,B)N material~~ deposited on said interlayer.